REMARKS

In view of the foregoing amendments and the following remarks, reconsideration is respectfully requested. The various grounds of rejection and objection are traversed.

Claims 1 to 6, as filed in this application, have been cancelled without prejudice or disclaimer.

New claims 7 to 10 have been added.

In the Office Action, Claims 1-2 were rejected under 35 USC §102 over Applicant's Admitted Prior Art (APA).

Claims 1-2 were also rejected under 35 U.S.C. §102 (b) over García, et al (US patent no. 4,654,066).

Claims 3-6 were rejected under 35 U.S.C. §103 (a) over García, et al (US patent no. 4,654,066) as applied to claims 1-2 above in view of McCreery (US patent no. 4,104,046) and in further view of Suzuki (US patent no. 5,593,608).

Reference is now made to the rejection of Claims 1-2 under 35 USC §102 over the Prior Art cited in the specification, and over the US patent no. 4,654,066 to García, et al. García, et al relates to an electronic system to control cooling molds in a glassware forming machine. The control system is related with a mold cooling system for I-S machines which normally include eight sections, wherein the cooling air is obtained from the ambient medium by a fan 1 to a main duct 2 which connects with a secondary duct 3, for supplying cooling air to cooling ducts 4 which lead to the different sections of I-S machine (normally eight sections), which are connected to each cooling duct (numeral 4).

The duct 3 is of a special design so that it is possible to absorb pressure drops in the supply to the different sections of the machines irrespective of the number of sections being operated at any given time.

A shutter valve 6 located in the duct 3, upstream of cooling ducts 4, regulates the mass flow of cooling air to the different sections of the machines through ducts 4. As can be seen in US patent no. 4,654,066, Fig. 1 corresponds to the described prior art illustrated in Fig. 1 of the present application.

The conventional mold cooling system (prior art) described in the present application comprises four fans VI, V2, V3, V4, three of which operate to provide cooling air to the four machines, remaining one as a backup in the case of failure of any of the fans which were operating. These fans V1 to V4 are placed in special rooms located in the cellar of the plant (no illustrated). A plenum chamber P consisting of a manifold, outside of the room of fans, which associates the four fans V1 to V4 and having four discharges D1, D2, D3 and D4, and four ducts known as "shoes" Z1, Z2, Z3 and Z4. Each of the "shoes" Z1 to Z4 is gradually diminished in diameter to form a cone toward the last section of the machine.

In the prior art described above, a "shoe" for example Z1 shown in the present application, corresponds to the secondary duct 3 illustrated in the US patent 4,654,066.

This type of arrangement uses a series of four fans and a manifold or plenum chamber associated with the four fans to distribute the cooling air to the sections of the glassware forming machine.

However, as is described in the present application (see Fig. 2) the mold cooling system of the present invention comprises an individual cooling apparatus, referred as CA1 to CA8, per each section of the machine, coupled to the frame F of each respective section S1 to S8 of an I-S machine.

Each cooling apparatus CA1 to CA8 individually comprises a fan F1 to F8 driven by a motor M1 to M8, and a control system CS1 to CS8 including an inverter I1 to I8, which controls the speed of the motor.

The control system CS1 to CS8 also includes a temperature sensor to determine the mold temperature, so that the control system is carried out in a close loop to control the inverter I1 to I8 in order to vary the speed of the motor M1 to M8 of the cooling apparatus CA1 to CA8. In this way, the arrangement of the mold cooling system of the present invention is surprisingly more efficient and more economic than that of the mold cooling systems described in the prior art.

In the prior art it has always been desirable to make a cooling system which is highly efficient so that it has minimum losses. Also, it is required to have an arrangement to avoid a negative impact in the production when sections of an I-S machine are turned off. Furthermore it is sought to save electric energy since after the compressors, the cooling of the molds is the second concept of greatest consumption of electric energy in the plants.

By providing an arrangement having all the above-mentioned advantages, the production costs will decrease because of a lower consumption of energy, while

productivity is increased because of less defects in the products caused by otherwise deficient cooling of the molds.

Under the arrangement of the present application, the biggest air fans of the special room, the plenum chamber and the duct know as "shoe" are eliminated and all this equipment is substituted by an individual fan in each section of the machine. So, in the event of failure of an individual fan, only one section of the machine is affected, and this can be easily substituted by another.

The García, et al '066 patent discloses an electronic system to control cooling of the molds with a conventional arrangement, as those described in the prior art, that is, a source of cooling air (four fans), a manifold for said cooling air and a series of ducts known as "shoes" for directing the cooling air to all the molds. With the cooling system of the present application a control system is placed by each section of the machine.

The present invention avoids the following disadvantages generally found in the prior art:

1. Substantial consumption of electric energy;

2. Upon failure of a fan, the entire machine or several machines are affected when having a plenum;

3. Substantial losses and pressure fallings because of the path through the air ducts.

4. Necessity of having large special rooms for the fans;

5. A backup which is usually very expensive;

6. Upon stopping a section, the pressure of the "shoe" is increased and the surplus air goes to the other sections, causing disturbances in the process;

7. Each starting of these fans causes great picks of electric current (which in the case of Mexico, for example, the Federal Commission of Electricity could charge because of surpassing the maximum demand) as well as mechanical strengths in the rotor and bearings.

US patent no. 4,104,046 to McCreery, relates to an automatic temperature control system for a glass forming machine of the press and blow type which automatically senses the heat transfer condition of the parison-forming or blank-forming units thereof and automatically controls the supply of cooling fluid, specifically air, thereto to maintain properly controlled temperatures in the various units so that the final formed ware will be of uniform quality.

However, in this case, the apparatus of US patent no. 4,104,046 uses one control which is accomplished automatically by temperature-sensing instruments located at precisely selected positions along the paths of movement on the machine of the blank mold and plunger of each forming unit, which produce a signal from each member that operates a controller which, in turn, operates a loading regulator in a cooling air supply line for that particular member.

The supply of temperature-controlling fluid comprising independent means for controlling the supply to each of passages of a mold and a plunger includes independent temperature-sensing means. A rotatable turret which carries a plurality of forming units each of which includes one of the blank molds and a cooperating plunger for pressing

a blank and a blow mold for subsequently blowing the blank into final shape, the temperature-sensing means being located around the turret to sense the blank mold after the article is formed therein and the plunger after it has been withdrawn from the blank mold in which it pressed the blank.

A fluid supply unit is mounted in cooperative relationship with the turret, the independent means for controlling the supply of fluid to the passages of the mold and plunger including a separate supply line connected to each. The fluid supply unit comprises manifolds which rotate with the turret and are connected to each of the supply lines, and a source of supply connected to the manifolds to permit relative rotation thereof.

In US patent no. 4,104,046, the cooling of the press and blow molds is carried out by means of individual supply lines (by each mold) which are connected with a rotatable turret, which also includes other type of supply lines as example, compressed air blow pressure, compressed air low blow pressure, compressed air for cooling, water, etc. That is, the rotatable turret also is used to control the movements of the plunger and mold for forming the glass articles. Furthermore, in the patent it is commented that the fluid supply unit comprises manifolds which rotate with the turret. US patent no. 4,104,046 could be conceptually equivalent to the prior art, but does not disclose or suggest the present invention.

In this patent, this does not comprise a main air source (rotatable turret) for individually distributing cooling air to each mold. Neither are manifolds that are rotatable with the turret. The mold cooling system of the present invention, comprises an individual

cooling apparatus for each section of the machine, and each cooling apparatus individually comprises a fan driven by a motor and an individual control system by each cooling apparatus.

US patent no. 5,593,608 to Suzuki relates to a temperature control method and apparatus for use in thermal processing equipment. The temperature controller controls a plurality of heating members, thereby to uniformly distribute temperature in the processing chamber of the equipment, so that the members contained in the chamber may be heated to the same temperature. Temperature sensors are provided near the heaters and outside a reactor tube for detecting the temperature in the upper heating zone of the processing chamber. Nevertheless, more or less temperature sensors may be located at different positions. Only one temperature sensor may suffice in the case where the temperature in the heating zones of the chamber are not controlled independently of one another. If necessary, temperature sensors may be provided in the reactor tube 54, in addition to the sensors 67a, 67b and 67c located outside the tube 54, for the purpose of obtaining, for example, parameters of a correction signal.

In operation, the temperature sensors 67a, 67b and 67c generate temperature signals representing the temperatures they have detected. The temperature signals are supplied to the temperature controller 68. The controller 68 processes these signals in accordance with a temperature setting recipe corrected, thereby generating control signals. Some of the control signals are supplied to a heater power source 69. Driven by these control signals, the heater power source 69 supplies power to the heaters 55a, 55b and 55c, thereby to control the output of the heaters. Another control signal is

supplied to an inverter 70. In accordance with this control signal the inverter 70 changes the frequency of a drive signal for driving the air-supply fan 60. The rotational speed of the fan 60 is thereby controlled.

The Examiner stated that at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include with García et al's cooling system the closed loop temperature control system of McCreery.

However, it is not possible to suggest that the present invention would have been obvious to one of ordinary skill in the art because, as was previously commented, each invention has different characteristics and operative conditions. Furthermore, neither García, et al, McCreery nor Suzuki suggests that either may be combined to provide elements and features of the present invention. Therefore, it is respectfully submitted that any attempted combination of the García, et al, McCreery and Suzuki patents is submitted to be one of hindsight.

It is respectfully submitted that the present invention as claimed is neither disclosed nor obvious in view of either the García, et al, McCreery or Suzuki patents, considered individually or in combination, in whole or in part.

A number of courts seem to be of the opinion that where, at least structurally, the invention consists of a new combination of old elements, the unobviousness requirement is satisfied if either the combined elements cause a synergistic result, or produce unusual or surprising consequences, or perform a new or different function.

The advantages obtained by the mold cooling system of the present invention were cited in page 8 of the original specification, and they include for example:

a) Saving of energy by using inverters;

b) Reduction in the mold preheating time, because the fan is maintained turn off at the desired time;

c) Upon failing of a fan, this affect only a single section;

d) Special rooms are not required;

e) As the mold cooling system is constructed as a modular system, any change results very easy and quickly;

f) Upon stopping and starting sections, the others are no affected, i.e. there is no interference at the process because the "shoe" is not pressurized and depressurized because this do no longer exists.

In view of the above, the present invention is not, and cannot be considered as being anticipated by or obvious over the prior art, considered individually or in combination, in whole or in part. As applicant has previously demonstrated, the mold cooling system for glassware forming machine of the present invention was conceptualized in an entirely different form from the art cited by the Examiner and with a different combination of steps, equipment and materials.

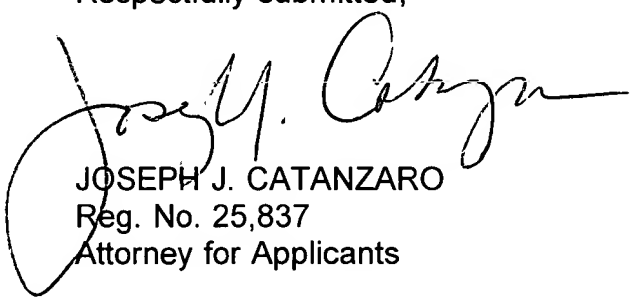
In conclusion, the subject invention as recited in new claims 7 - 10 are submitted to be patentable over the combination of García, et al, McCreery and Suzuki, particularly since it employs an unobvious combination of steps and components which are neither taught or suggested by the art. Reconsideration and withdrawal of the rejection based on the cited art is respectfully requested.

Accordingly, entry and approval of the present amendment an allowance of all the pending claims are respectfully requested.

A Petition for Extension of time to respond to the office to November 9, 2003 is submitted herewith together with a check in the amount of $930 to cover the requisite fee.

Please credit any overpayments and charge any deficiencies to Deposit Account no. 01-0035.

Respectfully submitted,



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